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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/507,521	02/18/2000	Min Xie	15-CT-5271	7950

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EXAMINER	
DO, CHAT C	

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/507,521	XIE ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,5-11,13-17,19-25 and 27-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5,6,13,14,19,20,27,28 and 32-35* is/are allowed.

6)☒ Claim(s) *2,7,15,16,21,29-31,36 and 37* is/are rejected.

7)☒ Claim(s) *3,11,17,25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to Amendment, filed 10/04/2004.

2. Claims 2-3, 5-11, 13-17, 19-25, and 27-37 are pending in this application. This action is made non-final after a RCE filed 10/04/2004.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2, 7, 15-16, 21, 29-31, and 36-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Larson (U.S. 5,365,465).

Re claim 2, Larson further discloses a method in Figures 2-5 x has a binary exponent e (e.g. 104 in Figure 4B) in addition to the binary mantissa m (e.g. 106 and 108 in Figure 4B), and further wherein computing (abstract) a value of log(x) for the binary floating point representation of x comprises the steps of: partitioning (col. 6 lines 3-10 wherein the upper-bit as the order of interval and the lower-bits as the size of interval) the binary mantissa m of a binary representation of x in a memory, the representation of x including a binary exponent e and the binary mantissa m (102 in Figure 4B), wherein a first most significant part of the partition (col. 6 lines 3-10 wherein the upper-bit as the order of interval) corresponds to a region i and a second less significant part of the

partition (col. 6 lines 3-10 wherein the lower-bits as the size of interval) corresponds to a region delta x, where delta x is a distance from the binary mantissa m to the reference point ai = 1 + (i + 0.5)/N (wherein N is the value of upper-bits); and computing (equation 5 in col. 6) an approximation to log(x), using the first degree polynomial in the binary mantissa m and a precomputed value of $\log(a_i)$ (col. 6 lines 53-56).

Re claim 7, Larson further discloses a method in Figures 2-5 x is represented by a 32-bit representation (col. 6 lines 45-50) having a sign bit (line 49 in col. 6), an 8-bit exponent (line 49 col. 6), and a 23-bit binary mantissa (line 50 col. 6) having bits b22 to b0 in order of significance with b22 being a bit of greatest significance; and the step of partitioning the binary mantissa m comprises the step of selecting a first group of bits b22 through b16 (e.g. col. 8 line 38 wherein the look-up bit size is 7) as index i and bits15 through b0 as delta x.

Re claim 15, Larson discloses a method in Figures 2-5 a computing device comprising a memory (col. 1 lines 27-32) in which binary floating-point (e.g. 104 in Figure 4B) representations of particular numbers are stored, device being configured to: partitioning (col. 6 lines 3-10 wherein the upper-bit as the order of interval and the lower-bits as the size of interval) of an interval between 1 and 2 into N equally spaced sub-regions, precomputing a reference point ai (col. 6 lines 8-15) of each of N equally spaced sub-regions where i = 0 to N-1, selecting N sufficiently large (e.g. N = 2^16 = 65536 in col. 8 line 46) so that, within each sub-region, a first degree polynomial in m computation of log(m) within a preselected degree of accuracy for any m within the sub-region (col. 6 lines 53-56), where m is a mantissa of a binary floating point representation of a variable

x (col. 7 lines 55-67), and computing (equation 5 in col. 6) a value of log(x) for binary floating point representation of a particular number x stored in a memory utilizing the first degree polynomial in the binary mantissa m, wherein log(x) is a function of a distance between the reference point ai and the binary mantissa m; and generate an image (col. 1 lines 15-20) by using the computed value of log(x).

Re claim 16, it is a computing device claim of claim 2. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 21, it is a computing device claim of claim 7. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 29, Larson further discloses a method in Figures 2-5 the approximation to process at least one image of an object of interest (col. 1 lines 15-20).

Re claim 30, it is a computing device claim of claim 29. Thus, claim 30 is also rejected under the same rationale as cited in the rejection of rejected claim 29.

Re claim 31, it is a method claim of claim 15. Thus, claim 31 is also rejected under the same rationale as cited in the rejection of rejected claim 15.

Re claim 36, Larson further discloses a method in Figures 2-5 the reference point ai is a center point of each of the N equally spaced sub-regions (Figure 5).

Re claim 37, it is a method claim of claim 36. Thus, claim 37 is also rejected under the same rationale as cited in the rejection of rejected claim 36.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 8-10 and 22-24 are rejected under 35 U.S.C. 103(a) as being obvious over Larson (U.S. 5,365,465) in view of Wallschlaeger (U.S. 5,345,381).

Re claim 8, Larson does not disclose the above method can be utilized in a computed topography scanner for generating an image of an object from acquired projection data of the object. However, Wallschlaeger discloses the use of logarithm function (col. 1 lines 35- 40) in computed topography scanner (Figure 1) as in image reconstructor (col. 1 lines 25-35) for generating an image of an object by manipulating the intensity values (Figure 3). Therefore, it would have been obvious application to a person having ordinary skill in the art to use the method of logarithm function in topography scanner as in image reconstructor for generating an image of an scanned object as seen in Wallschlaeger's invention into Larson's invention because it would enable to yield faster results and less error in processing image.

Re claim 9, Larson further discloses a method in Figures 2-5 natural logarithm is used in an image reconstructor to generate the image of the object (col. 1 lines 15-20).

Re claim 10, it has same method as cited in claim 2. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 22, it is a computing device claim of claim 8. Thus, claims 22 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 23, it is a computing device claim of claim 9. Thus, claims 23 is also rejected under the same rationale as cited in the rejection of rejected claim 9.

Re claim 24, it is a computing device claim of claim 10. Thus, claims 24 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Allowable Subject Matter

7. Claims 5-6, 13-14, 19-20, 27-28, and 32-35 are allowed.

8. Claims 3, 11, 17, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments with respect to claims 2, 7, 15-16, 21, 29-31, and 36-37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124

November 22, 2004

ANIL KHATRI
PRIMARY EXAMINER